A PROGRAM FOR IMPROVING MANAGEMENT AND RESEARCH OF FISHERIES IN THE SOUTHEAST REGION

SOUTHEAST/YAKUTAT SHELLFISH FISHERIES

Project Bluebook – 2004

Alaska Department of Fish and Game
Division of Commercial Fisheries
Southeast Region

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SHELLFISH FISHERIES INTRODUCTION

Overview of Southeast Region Shellfish Fisheries

Shellfish fisheries in the Southeast Region target a diversity of species across all management areas from Ketchikan to Yakutat. The major shellfish fisheries occur in Area A, from Dixon Entrance to Cape Fairweather, and these include pot fisheries for spot and coonstripe shrimp, Tanner crab, red king crab, golden king crab, and Dungeness crab, as well as a long-standing beam trawl fishery for pink shrimp. Yakutat area fisheries, from Cape Fairweather to Cape Suckling, include pot fisheries for Tanner crab, Dungeness crab, and shrimp, as well as a trawl fishery for shrimp and a dredge fishery for scallops. Regionally, all of these fisheries are important economically, grossing over $14 million annually in landed value in recent years. From a statewide perspective, the shrimp fisheries are the last significant fisheries of their kind, and the Dungeness crab fishery is the largest in the state.

The major issues facing the region's shellfish fisheries are fleet intensification, local depletion, and the resulting need for better stock assessment information and for more localized and active management. Traditionally, the shellfish fisheries were managed with regional guideline harvest levels based on historical catch records. Those methods are largely inadequate now that our fleets have become larger and more efficient. As a consequence, the shellfish stocks have been fished hard, in some cases for decades. As fishing pressure has grown, the region's shellfish stocks have seen depletion of local populations. This occurred in the past decade in the Yakutat area for both Dungeness and Tanner crabs, and those fisheries are closed to allow rebuilding to occur. Similar large scale closures of shellfish fisheries in Southeast Alaska are not anticipated; however, local harvest and effort trends indicate our shellfish stocks require increasingly fine-scaled assessment and management to avoid depletions of local populations that can accumulate to force regional stock closures.

Stock Assessment for Southeast Regional Shellfish Fisheries

The information available to manage regional shellfish fisheries lags far behind the information that is needed. Shellfish abundance is difficult to estimate. They do not swim home to natal streams where they can be counted, as salmon do, and they have a diversity of complex life histories that makes stock assessment challenging. However, shellfish are not impossible to count, and in fact, our department has pioneered the use of various stock assessment tools to estimate crab populations, as for example, has been done with several important stocks in the Bering Sea. The value in doing so is to be able to set harvest levels based on abundance, which is the hallmark of successful fisheries management, including our state's salmon management program. To this end, we have adopted the catch-survey analysis used for several Bering Sea crab stocks to estimate the abundance of red king crab in Southeast Alaska, the only regional shellfish program for which we have absolute stock abundance information. This information has been used successfully for nearly a decade to set conservative harvest levels based on abundance.

The shellfish program in the Southeast Region has made substantial progress towards developing improved stock assessment for species other than red king crab; however, much of what has been done to date in improving stock assessment has been on a trial or pilot study basis. There are significant shortfalls in funding to fully establish the programs that are needed to meet the department's commitment to sustainable fisheries. The stock assessment projects described here are designed as a concerted move towards abundance-based management similar to the regional program for red king crab.

Management of Southeast Regional Shellfish Fisheries

Management of the shellfish fisheries in the Southeast Region is in transition. Historically, harvest guidelines were set for each region (Southeast and Yakutat) as a whole without regard to fishing patterns and local stock concentrations. For this reason, management has been the responsibility of the regional shellfish management biologist and there has been a reluctance to move towards more localized management without sufficient staffing and operational funds. Intensification of regional shellfish fisheries has led to an evolution away from single guideline harvest levels for the region as a whole.

Increasing effort in the Southeast Alaska pot shrimp fishery in the mid-1990s led the department to establish district level guideline harvest levels and to transfer management authority to individual area offices, principally Ketchikan, Petersburg, Sitka, Juneau and Haines. Staff in those offices can more fully focus on tracking local catches to stay within the guidelines, and they are also more attuned to local area concerns, such as localized depletion and missing year classes. Transferring management authority to area offices is not the solution for all shellfish fisheries; indeed, the area office staffs would have to be enlarged significantly for that to be possible. Instead, gradual changes are being put into place to accomplish localized management where feasible.

The red king crab fishery has a mixture of local and regional management. The guideline harvest level is set for the region, but the survey-based stock assessment program allows the department to identify local areas, usually bays, having low abundance or weak stock segments. As needed, these areas may be closed for one or more seasons, or they may be opened for a shorter period than the region as a whole to allow local populations to rebuild. Also, to meet commercial fishery allocation guidelines set by the Board of Fisheries, the department sets maximum harvest levels in Section 11-A near Juneau. The 2001 fishery was closed early in Section 11-A to stay within the allocation guidelines. Similar harvest controls are possible on a district level basis using stock abundance estimates from the assessment surveys, and these may be used in the future depending on the availability of staff resources to achieve more finely scaled management.

The golden king crab fishery has five management areas in regulation, with several of these areas subdivided in the last few seasons. This has been important in allowing harvests to more accurately reflect varying stock status among areas. The drawback of more finely dividing the management activity has been an increasing burden to track local catches by department staff. Despite this burden, the department recognizes the importance of more localized management in ensuring long-term sustained yield. This is an important economic as well as biological goal,

given that the golden king crab fishery has exceeded the harvests of the red king crab fishery by a factor of two in recent years.

The Southeast Tanner crab and Dungeness crab fisheries are two of the most valuable regional shellfish fisheries. They are both managed on a regional basis, and both have stock assessment surveys in developmental stages. As the stock assessment programs mature, there will be increasing opportunities to manage these on a more precise basis to minimize the risk of local depletions and to ensure long-term sustained yield. It will be important for these fisheries to have adequate staffing in the regional and area offices to meet the increasing needs and opportunities for localized management.

Table 1. Summary of proposed shellfish fishery projects and estimated costs (thousands of dollars).

Project	Estimated First-Year Cost	Estimated Annual Continuing Cost	Duration
A. Shellfish Project Staff			
A.1. Southeast Alaska Shellfish Biometrics	$80.0	$80.0	Long Term
A.2. Southeast Alaska Shellfish Project Fishery Biologist II	$58.0	$58.0	Long Term
A.3. Southeast Alaska Shellfish Project Fish and Wildlife Technician	$45.0	$45.0	Long Term
B. Shellfish Stock Assessment			
B.1. Southeast Alaska Pot Shrimp Stock Assessment	$218.0	$218.0	Long Term
B.2. Southeast Area Dungeness Crab Stock Assessment	$143.5	$143.5	Long Term
B.3. Southeast Alaska Golden King Crab Stock Assessment	$83.5	$83.5	Long Term
B.4. Southeast Alaska Tanner Crab Stock Assessment	$66.0	$66.0	Three years
B.5. Yakutat Area Dungeness Crab Stock Assessment	$130.5	$130.5	Long Term
B.6. Yakutat Area Tanner Crab Stock Assessment	$66.5	$66.5	Long Term
B.7. Red king crab mark-recapture study	$34.0	$34.0	1 Year
C. Personal Use Harvest Documentation			
C.1. Southeast Region Shellfish Personal Use Harvest Documentation	$33.0	$33.0	Long Term

PROPOSED PROJECTS

This document contains a list of projects proposed for increased funding. The projects described are either not conducted due to a lack of funding or are currently operated at levels insufficient to meet increasing management needs. Projects are grouped into four categories (A–D) and are listed in Table 1. The categories are not prioritized, but the projects within each category are listed in order of priority.

The first category (A) includes a list of additional staff needed to maintain operating the Shellfish Project at the current level of activity. Additional staffing is the greatest need of the Shellfish Project. Currently, shellfish biometric needs are addressed by one Biometrician II, a position shared with the Miscellaneous Invertebrate Project. An additional biometrician is needed to develop the analytical approaches and tools for determining sustainable harvest levels for the region's major shellfish fisheries. Due to the overwhelming workload on the Shellfish Biometrician, Shellfish Project biometric needs are not being met and a backlog of analyses continues to grow. Additionally, due to reductions in funding in FY04, the Shellfish Project lost two PCNs, a Fishery Biologist II and a Fish and Wildlife Technician III. The biologist position's primarily responsibilities were to 1.) plan, implement and report on the Tanner crab stock assessment survey, 2.) take a lead role management of the Tanner crab/golden king crab fishery, and 3.) assist in development of Tanner crab management plan. The FWT III position played a major role in supporting inseason fisheries management activities for red and golden king and Tanner crab fisheries as well as in coordinating logistics for and participating in all crab and shrimp stock assessment surveys, golden king and beam trawl shrimp on-board observing, and collecting samples from crab and shrimp commercial landings. Functions of both positions have been distributed among other Shellfish Project staff members, however this has increased already heavy workloads and has lessened the ability to adequately meet the needs of other shellfish projects. The Shellfish Project has taken on several major surveys over the past several years, with only a modest increase in staffing. Newly implemented projects include Tanner crab stock assessment survey, pot shrimp stock assessment survey, Dungeness crab stock assessment survey, and golden king crab on-board observer program. Although vital information on stock status is being collected, through stock assessment surveys, their development has reduced the time available for staff to regularly communicate with commercial fleets, creating a growing gap of understanding between fishers and the department. Furthermore, the insufficient staffing levels are preventing full and timely incorporation of this information into management and dissemination to the public. Hence, we are currently considering discontinuing one or more of these assessment programs.

The second category (B) covers six stock assessment projects. Projects in this category were ranked according to the most pressing needs to fulfill the mandate for achieving sustainable harvests. The first priority project is stock assessment for the Southeast pot shrimp fishery. This is probably the single most fragile shellfish fishery in the region in terms of the potential for serial stock depletion, and also one of the most challenging to assess. Stock assessment for the Dungeness crab fishery is ranked second, due largely to the intense nature of the fishery and the high degree of uncertainty regarding stock status and the viability of the relatively passive

management system that has been used historically. Stock assessment for the golden king crab fishery is ranked third, due largely to the paucity of information on the stocks and the growing importance of this fishery. Tanner crab research is ranked fourth. Staff conduct a Tanner crab survey that provides appropriate relative abundance information, but additional research is needed to augment survey data so that those data can be used for abundance-based management. The fifth and sixth ranked projects are for assessment of Yakutat area Dungeness and Tanner crab, respectively. Both fisheries are closed and are to remain closed until better stock status information is obtained.

The remaining two categories each have only one project, and therefore are not ranked. Local area shellfish catch monitoring (Category C) is important for implementing more finely scaled management of the region's shellfish stocks. This effort will allow greater precision in meeting management goals. Personal use harvest documentation (Category D) is important for estimating total fishing mortality as personal use harvests increase in significance relative to commercial harvests.

A. Southeast Alaska Shellfish Project Staff

Project A.1. Southeast Shellfish Biometrics

Location: Regionwide.

Primary Objective: To fully develop the stock assessment methods and to provide ongoing biometric support for the region's shellfish research projects.

Description: Currently, just one position is funded to provide biometric support for all shellfish and dive fisheries in the Southeast and Yakutat areas. A backlog of stock assessment modeling, analyses, and reporting is accumulating. The recent addition of two major stock assessment projects (Dungeness crabs and pot shrimp) are now in the phase of project development and require a significant amount of population modeling and harvest strategy determination. Other existing, new projects requiring biometric support are the onboard fishery sampling programs for golden king crab and beam trawl shrimp. Additional biometric support for future, high priority studies include stock assessment programs for Southeast Alaska golden king crab fisheries and Yakutat area Dungeness and Tanner crabs. Funding for this position was included in the division's new fish and game license fees budget effective FY02, however, this position was cut following lower than expected revenues from license sales.

Duration: This project requires stable long-term funding because it is the salary support for a professional biometrician.

Estimated Annual Costs: $80.0.

Project A.2. Southeast Alaska Shellfish Project Fishery Biologist II

Location: Regionwide.

Primary Objective: To conduct fishery management and stock assessment for the region's Tanner crab fishery and assist with other shellfish management and research needs.

Description: Currently, the Tanner crab fishery management and research responsibilities are met by other shellfish staff. Although all other major shellfish fisheries have a project biologist assigned to them (red and golden king crab, shrimp and Dungeness crab), the Tanner crab fishery stands alone without dedicated personnel. The Tanner crab fishery is an important shellfish fishery in Southeast Alaska and management of this fishery is complicated by a simultaneous golden king crab fishery, recent low stock levels, intense commercial fishing directed at traditional 'core' harvest areas, and low acceptance by the fleet. Management of this fishery would highly benefit from a dedicated biologist to both reduce the excess workload of other staff members, and to direct more attention to this complicated fishery.

Duration: This project requires stable long-term funding because it is the salary support for a professional biologist.

Estimated Annual Costs: $58.0.

Project A.3. Southeast Alaska Shellfish Fish and Wildlife Technician

Location: Regionwide.

Primary Objective: To assist project biologists with stock assessment, management and port sampling in support of the region's shellfish fisheries.

Description: Primary duties of this position are: 1) to assist with inseason management of red and golden king and Tanner crab fisheries. This includes entry of logbook data, editing fish tickets and port sampling, 2) logistical support for red king crab, Tanner crab, Dungeness crab and pot shrimp stock assessment surveys and golden king crab onboard observer program. This staff person also participates in these survey programs, enters survey data, helps with board of fisheries meetings preparations, and maintains the shellfish literature and photographic libraries. These support functions free shellfish biologists to perform on a higher level; to interact with the public, participate in professional meetings, report on data and conduct, or assist the shellfish biometrician with assessment analyses.

Duration: This project requires stable long-term funding because it is the salary support for a full-time Fish and Wildlife Technician III.

Estimated Annual Costs: $45.0.

B. Stock Assessment Projects

Stock abundance information that is collected independently of commercial harvest data is critically important for assessing the status of shellfish populations. The reason for this is that commercial shellfish fisheries target the largest individuals in the stock; however, the abundance of smaller individuals, as well as the abundance and reproductive condition of females, is also important information needed for decisions on allowable harvests. Hence, surveys are designed to assess these non-target as well as the marketable individuals of a fished species. This approach has proven successful in the region's red king crab assessment program, and the intent of the projects in this section is to bring the other major shellfish fisheries in the region to the same level of survey information.

Project B.1. Southeast Alaska Pot Shrimp Stock Assessment

Location: Southern and Central Southeast Alaska.

Primary Objective: Expand the pilot stock assessment surveys to more fully cover the major pot shrimp fishing grounds.

Description: Pre-season pot surveys are now conducted in Cordova Bay, Ernest Sound, Tenakee Inlet, and Hoonah Sound. These surveys are important because they provide estimates of stock strength that can be used to adjust guideline harvest levels and to prevent overfishing. The Federal Nearshore V program funds a portion of the pre-season survey in Cordova Bay and other areas are funded on a year-by-year basis depending on income from the fish and game licensing fees however stable funding for surveys in these areas is needed.

In addition, new funds are needed to more fully develop our pot shrimp stock assessment program, expand to surveying in Districts 1 and 2, and re-establish post-season surveys that were cut beginning in FY04. This will require enhanced biometric support, a project assistant, additional sea duty pay, and additional vessel charter, and operational funds. Post-season surveying allows application of index-removal and change-in-ratio methods to estimate stock abundance. It is important to re-instate this program as it has the potential to significantly shorten the time frame over which the survey becomes useful to management.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs Beginning FY05: $218.0 (maintain status quo at $95.0 + expanded surveys at $123.0).

Project B.2. Southeast Area Dungeness Crab Stock Assessment

Location: Southeast Alaska.

Primary Objective: Expand the pilot survey program to include more of the major fishing areas in the region and enhance the department's life history research in support of management.

Description: The Dungeness crab fishery in Southeast Alaska is intensifying, and we are working with an industry task force and the Alaska Board of Fisheries to develop fishing strategies to minimize risks of overexploitation and stock depletions. We initiated a pilot program in FY01 to estimate abundance and exploitation rates of Dungeness crab in two major fishing areas of Southeast, near Petersburg and Wrangell. In FY02, we expanded the preseason stock assessment survey to additional fishing grounds in northern Southeast, and added post-season surveys in both southern and northern Southeast. Post-season surveys were eliminated due to budget shortfalls in FY04.

In conjunction with the survey efforts, the department has initiated basic life history research to estimate growth rates, molting increments, and molt timing and natural mortality rates. Currently, we are conducting a tagging study to determine molt increment and molting probability in Dungeness crab. In addition, pot soak time and mesh selectivity studies are needed. These data are critical for interpreting survey results.

Additional biologist support, sea duty pay, vessel charter, and operational funds are needed to more fully implement the stock assessment and analysis program. There are no Federal funds for this project.

Duration: A long-term stable funding source is desired.

Estimated Annual Cost Beginning FY05: $143.5.

Project B.3. Southeast Alaska Golden King Crab Stock Assessment

Location: Central and Northern Southeast Alaska Area.

Primary Objective: To institute a fishery-independent stock assessment of golden king crabs in Southeast Alaska.

Description: Current commercial fisheries in Southeast are managed on guideline harvest levels based upon historic harvests and estimates of recruitment based on port sampling during the fishery. In 2001 the department, in cooperation with the industry King and Tanner Crab Task Force initiated an onboard sampling program. However, very little is known about life history, growth rates, molting increment and timing, and stock distributions of golden king crab in Southeast Alaska. This places the golden king crab fishery at a high risk for overharvest. It is important for the department to have a fishery-independent measure of stock abundance, composition and distribution. The difficulty of fishing in the deep-water habitat of golden king

crab necessitates that the department work closely with industry to develop a survey wherein industry vessels and knowledge are incorporated. This program will include vessel charters, a project assistant (6 mm), sea duty pay, and operational funds.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs Beginning FY05: $83.5.

Project B.4. Southeast Alaska Tanner Crab Stock Assessment

Location: Northern Southeast Alaska.

Primary Objective: To estimate Tanner crab index of abundance

Description: The department currently funds a Tanner crab stock assessment (survey) program in northern Southeast Alaska. Additional funds come from a Federal Nearshore V grant beginning in FY04 to conduct pot soak time experiments. As fish and game license fees that fluctuate annually fund much of this survey, stable long-term funding is needed.

Cost per year for conducting soak-time experiments and a tagging project for Southeast Tanner crabs includes 6 mm for a project assistant, sea duty pay, vessel charter, and operational funds.

Duration: Three years.

Estimated Annual Costs Beginning FY05: $66.0.

Project B.5. Yakutat Area Dungeness Crab Stock Assessment

Location: Yakutat.

Primary Objective: To develop a pilot stock assessment program for Dungeness crab in the Yakutat area.

Description: The Yakutat area Dungeness crab stocks are presently in a collapsed state. The commercial fishery was closed effective for the summer and fall portions of the 2000/2001 fishing season. No stock improvement is evident with existing information. The fishery will remain closed until stock recovery can be demonstrated and an adequate research and management program has been developed for this fishery. The costs for initiating a pilot stock assessment program for Yakutat Dungeness crabs include funds for an additional 6 mm of a project assistant, sea duty pay, vessel charter, and operational funds.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs Beginning FY05: $130.5.

Project B.6. Yakutat Area Tanner Crab Stock Assessment

Location: Yakutat.

Primary Objective: To develop a pilot stock assessment program for Tanner crab in the Yakutat area.

Project Description: The Yakutat area Tanner crab stocks are presently in a collapsed state. The commercial fishery was closed effective with the 2000/2001 fishing season. No stock improvement is evident with existing information. The fishery will remain closed until stock recovery can be demonstrated and an adequate research and management program has been developed for this fishery. This project would work with industry to identify sampling locations and to conduct annual sampling to assess the status of the stock. Costs would include 6 mm of an additional project assistant, sea duty pay, vessel charter and operational funds.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs Beginning FY05: $66.5.

Project B.7. Red King Crab Mark-Recapture Study

Location: Southeast Alaska

Primary Objective: To produce estimates of biomass for several stocks in Southeast Alaska.

Project Description: Status of red king crab populations in Southeast Alaska are monitored in part by conducting a stock assessment survey that uses commercial-style pots to sample crab. A primary objective of the survey is to produce estimates of biomass for legal and mature male components of the population. This is accomplished by using a catch-survey model that estimates relative abundance by measuring changes in catch rates of various size classes of crab between years. The proposed project would estimate population size and biomass by using mark-recapture methods. The study would rely on the same techniques for sampling crab, however the study design and statistical analysis would be much different. The result would be an independent estimate of population size that could be used to ground truth estimates derived from the catch-survey model. This information could help verify estimates obtained by using existing methods or provide insights to help improve the current stock assessment approach.

Duration: 1 Year

Estimated Cost: $34.0k

C. Personal Use Harvest Documentation

Accurate harvest records are vitally important in fisheries management and the Commercial Fisheries Division goes to great lengths to obtain all catch information for commercial shellfish fisheries. Presently, there is only a limited program for documenting personal use catches. Several personal use fisheries have grown in recent years, and total mortality from those fisheries has become significant relative to total commercial harvests.

Project C.1. Southeast Region Shellfish Personal Use Harvest Documentation

Location: Southeast Alaska and Yakutat.

Primary Objective: To collect personal use shellfish harvest information from all major harvest areas/communities in the region.

Description: Presently, our knowledge of harvest by personal use and subsistence fishers of commercially important species of shellfish in the Southeast Alaska and Yakutat Areas are extremely limited. Our data is limited to a red king crab permit requirement in the Juneau area, and creel census data and mail-out survey data obtained by the Sport Fish Division from major communities in Southeast. The creel census primarily occurs during the salmon season, so harvesters are typically not interviewed during the late fall–spring season. A key component of population modeling requires knowledge of harvest by all user groups (known mortality). This project would fund conduct of a comprehensive, region-wide shellfish harvest survey.

Duration: A long-term stable funding source is desired.

Estimated Annual Costs: $33.0.